

## FREE SOFTWARE IN THE «3D MODELS IN GOOGLE EARTH» PROJECT

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The "3d models in Google Earth" project there was in O. M. Beketov National University of Urban Economy in Kharkiv since 2010 [1-3].

In the Google Earth free software, 3D models of buildings and structures included in the layer "the best 3D buildings" are visible to all Internet users.

The SketchUp (the best 3D modeling free software) is used for creating models.

The purpose of the "3d models in Google Earth" project is to provide students with practical skills in 3D modeling and to disseminate information about the University around the world.

We used the following free software in the model creating process:

1. Google Earth ([https://www.google.com/intl/en\\_uk/earth/](https://www.google.com/intl/en_uk/earth/)).
2. SketchUp (<https://www.sketchup.com/>).
3. The Free & Open Source Image Editors:
  - Paint.net (<http://paintnet.ru/download/>).
  - GIMP (<https://www.gimp.org/>).

The free SketchUp software makes it very easy to create 3D models and has a user-friendly interface. Moreover, while developing the interface, the balance between the functionality of the program and the ease of use was maintained.

The Trimble Company, which bought the program from Google, is going to turn SketchUp into a powerful design tool. In the new version, it became possible to obtain sets of working drawings from a 3D project (layout).

Layout SketchUp allows you to add views, customize the scale of the drawing, choose the thickness of lines, and add dimensions, callouts, etc.

SketchUp allows you to quickly build a sketch of the project - create a 3D model of the existing structure, define several types and add dimensions. After that, the model is ready for demonstration to the customer. In addition, the program makes it possible to demonstrate models to all who do not read 2D drawings.

The possibilities of using SketchUp 3D Warehouse - the world's largest database of 3D models - have been further expanded. There is no need to create your models from scratch. Millions of SketchUp models (from trees to interior objects) can be downloaded from the 3D Warehouse.

Despite the fact that Google has ceased to support the layer of 3D objects in Google Earth, the integration capabilities of SketchUp and Google Earth (import of terrain, photos of streets and models) have increased, allowing users to create their own layers of 3D models.

### References:

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[2] Бочаров Б.П. Проект «3D MODELS IN GOOGLR EARTH». Итоги первого года / Б.П. Бочаров, М.Ю. Воеводина, И.Л. Яковицкий // Международная научно-практическая конференция «Современные аспекты воспитания студенческой молодежи». – Х.: ХНАГХ. – 2013. – с. 26-27.

[3] Бочаров Б.П. Інформаційні технології в освіті : монографія / Б.П. Бочаров, М.Ю. Воеводина; Харків. нац. ун-т міськ. госп-ва ім. О. М. Бекетова. – Харків: ХНУМГ ім. О. М. Бекетова, 2015. – 197 с.